The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte SUJIT SHARAN AND GURTEJ S. SANDHU

Appeal No. 2005-2215
Application No. 09/825,613

ON BRIEF

Before RUGGIERO, DIXON, and LEVY , Administrative Patent Judges.
RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal from the final rejection of claims 1-4 and 29, which are all of the claims pending in the present application. Claims 5-28 and 30-66 have been canceled.

The disclosed invention relates to a plasma enhanced chemical vapor deposition (PECVD) process in which a substrate is placed in a PECVD chamber. The chamber is maintained under vacuum pressure while a precursor metal-containing deposition gas, a reactant gas, and an ionization enhancer agent are introduced into the chamber, and a plasma is generated from the gases within the chamber. In the particular claimed

embodiment, the ionization enhancer agent provides an ion promoting atmosphere and the substrate is contacted with a plasma of approximately 50 to 90 per cent of the metal-containing gas.

Claim 1 is illustrative of the invention and reads as follows:

A process of PECVD deposition comprising the steps of:

providing an ion promoting atmosphere: and

contacting a substrate with a plasma of approximately 50 to 90% of a metal-containing gas in said ion promoting atmosphere.

The Examiner relies on the following prior art:

Zhao et al. (Zhao)	6,051,286	Apr. 18, 2000 (filed Aug. 22, 1997)

Claims 1-4 and 29, all of the appealed claims, stand finally rejected under 35 U.S.C. § 102(e) as being anticipated by Zhao.[1]

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Briefs[2] and Answer for the respective details.

OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner and the evidence of anticipation relied upon by the Examiner as support

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[1] At page 2 of the Answer, the Examiner indicates that the 35 U.S.C. § 112, first and second paragraph, rejections of the appealed claims have been withdrawn.

[2] The Appeal Brief was filed August 29, 2003. In response to the Examiner's Answer mailed July 26, 2004 a Reply Brief was filed September 30, 2004 which was acknowledged and entered by the Examiner as indicated in the communication dated April 22, 2005.

our decision, Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answer. It is our view, after consideration of the record before us, that the Zhao reference fully meets the invention as set forth in claims 1-4 and 29. Accordingly, we affirm.

Turning to the merits of the Examiner's rejection, it is well settled that anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir.); cert. dismissed, 468 U.S. 1228 (1984); W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

At pages 3 and 4 of the Answer, the Examiner indicates how the various limitations in appealed claims 1-4 and 29 are read on the disclosure of Zhao. In particular, the Examiner points to the various portions of Zhao at columns 12, 36, and 37.

In our view, the Examiner's analysis is sufficiently reasonable that we find that the Examiner has as least satisfied the burden of presenting a prima facie case of anticipation. The burden is, therefore, upon Appellants to come forward with evidence and/or arguments which persuasively rebut the Examiner's prima facie case. Only those arguments actually made by Appellants have been considered in this decision.

Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived [see 37 CFR § 41.37(c)(1)(vii)].

Appellants' arguments in response assert that the Examiner has not shown how each of the claimed features are present in the disclosure of Zhao so as to establish a case of anticipation. In particular, Appellants contend (Brief, pages 7 and 8; Reply Brief, pages 4-9) that the Examiner has pointed to no disclosure in Zhao which satisfies the claimed requirement that a substrate or a surface is contacted with a "plasma of approximately 50 to 90% of a metal-containing gas ...."

After reviewing the disclosure of Zhao, in light of the arguments of record, we find ourselves in agreement with the Examiner's ultimate conclusion of anticipation set forth, in particular, at page 7 of the Answer, although not necessarily in agreement with some of the Examiner's reasoning in support of such conclusion. For example, we agree with Appellants (Reply Brief, page 6) that the Examiner, in asserting that Zhao discloses that the metal containing gas contributes 53% of the flow rate, has misinterpreted the disclosure of Zhao (column 36, lines 40-43) which is actually describing the percentage of the initial flow rate of the reactant gas, not the metal-containing source gas, to the final flow rate of the reactant gas. Similarly, we agree with Appellants that the Examiner has misinterpreted the disclosure of Zhao at column 36, lines 27-29 and 34-36 which actually describes the percentage of the initial flow rate of the reactant gas to the final flow rate of the reactant gas which is independent of the flow rate of the metal-containing source gas.

Notwithstanding our acquiescence with some of Appellants' arguments, we do agree the Examiner that the deposition process disclosed by Zhao operates under similar conditions and parameters as that disclosed by Appellants, and would therefore necessarily produce a similar result as claimed. For example, in comparing the process parameters disclosed by Appellants with those disclosed by Zhao we find that Appellants disclose (paragraph 0027) an operating temperature of 150-500 degrees Celsius (as set forth in dependent claim 3) while Zhao discloses (col. 6, line 40) a temperature of 400 degrees Celsius. In the same paragraph 0027 of the disclosure, Appellants describe an operating pressure of 1 millitorr to 10 torr (as set forth in dependent claim 4) and an RF power of 50-600 watts at a frequency of 13.56 MHz while Zhao discloses (col. 6, line 41) a pressure of 1-10 torr and an Rf power of 200-2000 watts at 13.56 MHz (Zhao, column 37, lines 45 and 51).

Proceeding further, Appellants disclose, in the same paragraph 0027, a flow rate of the metal-containing gas of 10-50 sccm and a flow rate of 10,000 sccm for the reactant gas, producing a ratio of the flow rate of reactant gas to source gas (at the disclosed upper limit of 50 sccm) of about 200:1. This corresponds to Zhao's disclosed (column 36, lines 42-43) reactant:source gas flow ratio of less than about 250:1. A final remarkable correspondence of Appellants' disclosed operating conditions and those of Zhao is Appellants' disclosed flow rate of 5000 sccm for the reaction-promoter gas (including

argon as set forth in dependent claim 2) which is identical to Zhao's disclosed (column 36, line 16) flow rate of 5000 sccm for the reaction-promoter argon gas.

With the above discussion in mind, we find to be totally without merit Appellants' contention (Reply Brief, pages 4 and 9) that Zhao discloses the exact opposite of a substrate contacting plasma of approximately 50 to 90% of a metal-containing gas or compound as claimed. In making this assertion, Appellants rely on Zhao's disclosure that the reactant gas to source gas flow ratio is less than about 250:1 and conclude, therefore, that since the reactant gas flow rate in Zhao is hundreds of times greater than the source gas, the contribution of the metal-containing source gas to the resultant produced plasma cannot be 50 to 90% as claimed. As discussed supra, however, Appellants' disclosed flow rates for reactant and metal-containing source gases, as well as the other process parameters, are similar if not in fact within the exact same range as those disclosed by Zhao. Thus, in our view, this factual situation can only lead to the conclusion that the system of Zhao, operating under similar disclosed parameters and conditions, will necessarily produce a plasma with the particular metal-containing percentage as claimed by Appellants.

In view of the above discussion, since the Examiner's prima facie case of anticipation has not been overcome by any convincing arguments from Appellants, the

Examiner's 35 U.S.C. § 102(e) rejection of appealed claims 1-4 and 29 is sustained.

Therefore, the decision of the Examiner rejecting claims 1-4 and 29 is affirmed.[3]

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

JOSEPH F. RUGGIERO
Administrative Patent Judge

JOSEPH L. DIXON
Administrative Patent Judge

STUART S. LEVY
Administrative Patent Judge

) BOARD OF PATENT APPEALS AND INTERFERENCES

[3] To the extent that we may have made reference to and relied upon different portions of the Zhao reference than the Examiner, this does not constitute a new ground of rejection. See In re Meinhardt, 393 F.2d 273, 280,157 USPQ 270, 275 (CCPA 1968); In re Azorlosa, 241 F.2d 939, 941, 113 USPQ 156, 158 (CCPA 1957).

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